US005476327A

United States Patent [19]

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[11] Patent Number: 5,476,327

[45] Date of Patent: Dec. 19, 1995

[54] **BOTTOM BRACKET FOR A BICYCLE**

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[21] Appl. No.: **385,895**

[22] Filed: **Feb. 9, 1995**

[51] **Int. Cl.**[6] **F16C 19/50**; G05G 1/14

[52] **U.S. Cl.** **384/545**; 74/594.1

[58] **Field of Search** 384/545, 512, 384/510, 540; 74/594.1

[56] **References Cited**

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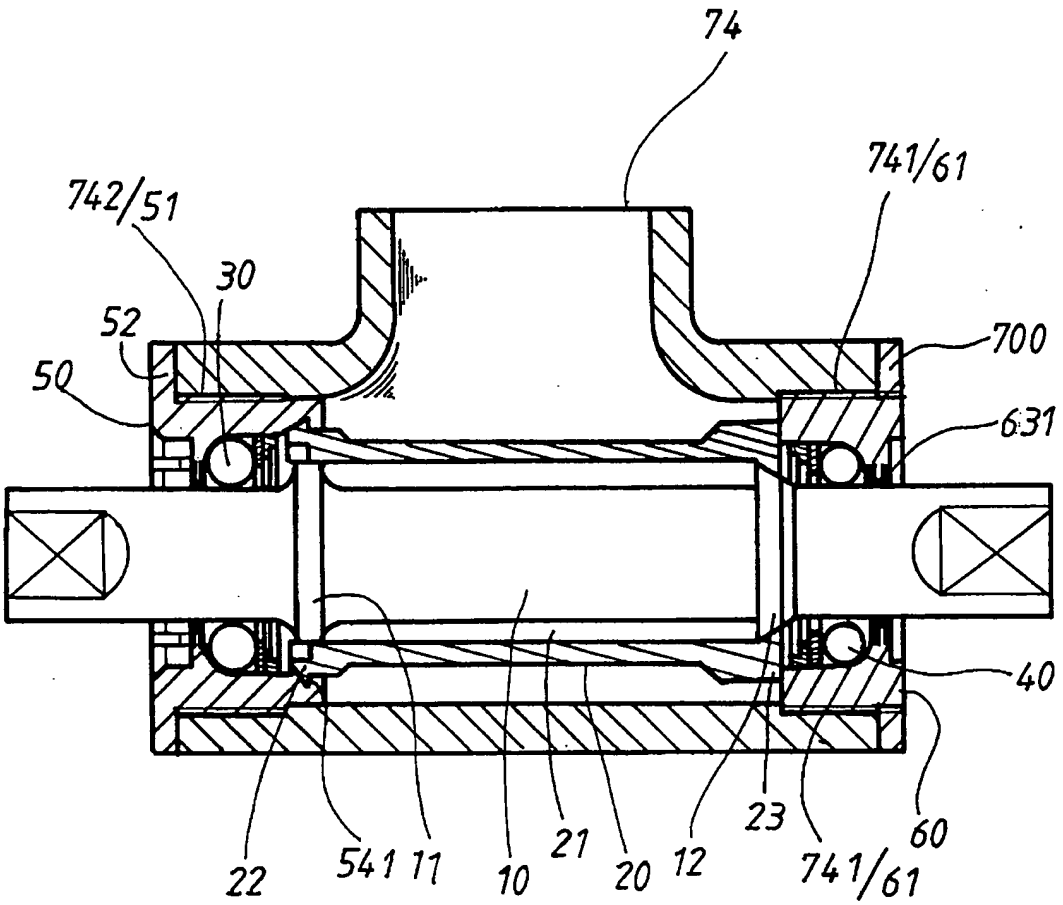
Primary Examiner—Thomas R. Hannon

[57] **ABSTRACT**

A bottom bracket for a bicycle includes an axle extending through a tube which has a first end with a first hole defined therein and a second end having a plurality of hook elements extending therefrom for engagement with a second cap at an engaging shoulder defined in the second cap, the first hole of the tube has a tapered inner periphery for engagement with a first flange having an outer tapered periphery of the axle, a first bearing is disposed between the first cap and the first end of the tube and a second bearing is disposed between the second cap and the second end of the tube, a housing threadedly engaged to an outer threaded periphery of the first and the second caps respectively such that the axle is securely engaged between the first cap, the tube and the second cap by the engagement of the hook elements and the engaging shoulder and the engagement of the first flange and the first hole of the tube.

2 Claims, 4 Drawing Sheets



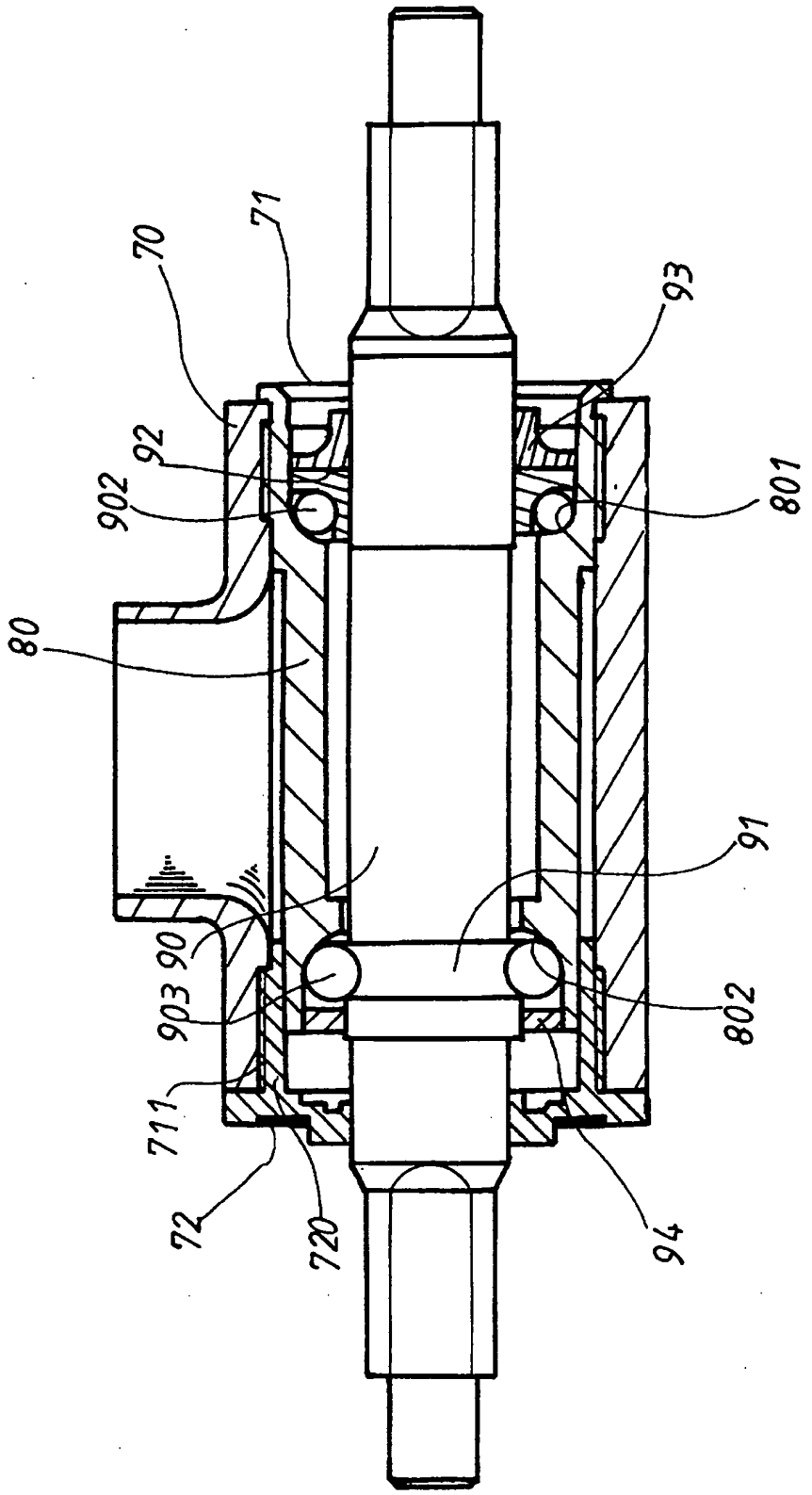


FIG 1
PRIOR ART

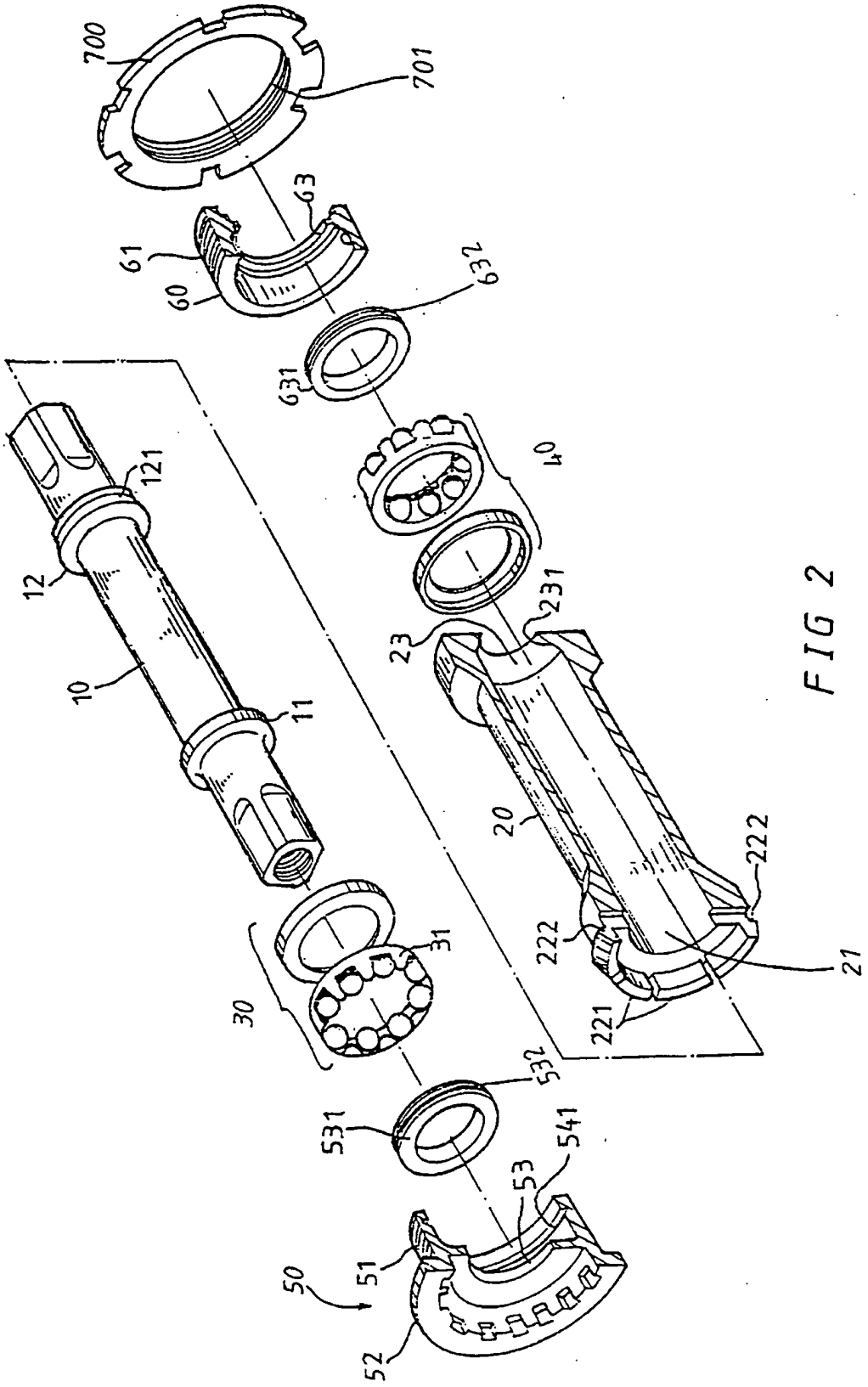

700
701
63
61
60
632
631
40
121
12
231
23
10
11
20
222
31
30
222
21
221
532
531
541
53
50
51
52

FIG 2

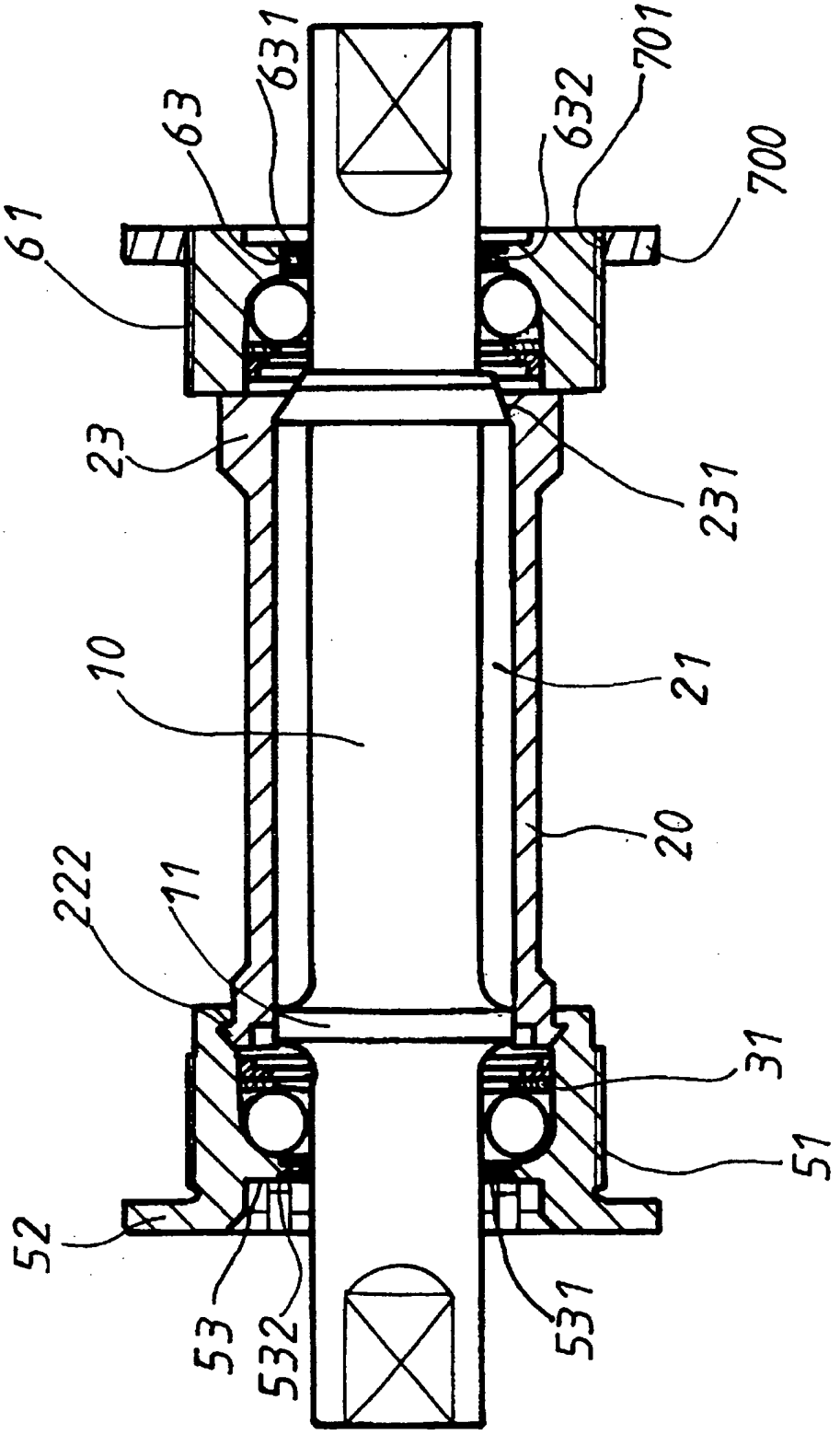


FIG 3

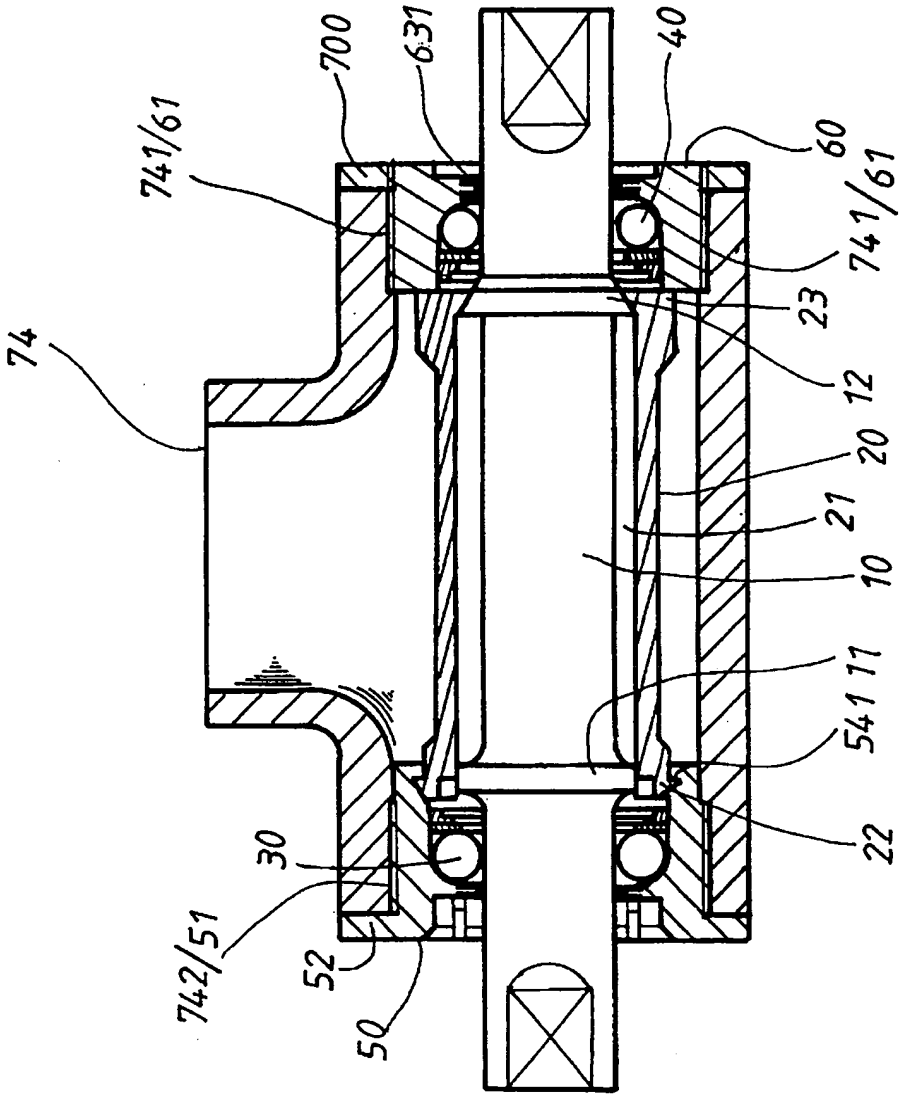

700
631
40
60
741/61
741/61
74
23
12
20
21
10
541
11
22
30
742/51
52
50

FIG 4

BOTTOM BRACKET FOR A BICYCLE

BACKGROUND OF THE INVENTION

The present invention relates to a bottom bracket and more particularly, to a bottom bracket for a bicycle, which provides an excellent positioning feature for an axle thereof.

A conventional bottom bracket of a bicycle is shown in FIG. **1**, which includes a housing **70**, a tube **80**, an axle **90**, a first bearing **902** and a second bearings **903**, the housing **70** having a first open end which has an inner threaded periphery defined therein and a second open end which has another inner threaded periphery defined therein, the tube **80** received in the housing **70** and having a first end with an outer threaded periphery defined therein for engagement with the inner threaded periphery of the first end of the housing **70** and a second end. A first recess **801** and a second recess **802** are respectively defined in each inner periphery of the first end and the second end of the tube **80**, the axle **90** extending through the tube **80** and having a groove **91** defined in an outer periphery thereof near the second of the tube **80** for receiving the second bearing **903** between the second recess **802** of the tube **80** and the groove **91**. A first cap **71** and a second cap **7** each having a central hole defined therein for the axle **90** extending therethrough are respectively engaged to the first end and the second end of the housing **70** for preventing dust from entering therein, the second cap **72** has a tubular portion **720** extending from a side thereof toward the first end of the housing **70** and disposed between the second end of the tube **80** and the second end of the housing **70**, the tubular portion **720** has an outer threaded periphery **711** for engagement with the inner threaded periphery of the second end of the housing **70**. The first bearing **902** is rotatably received between the first recess **801** of the tube **80** and a race **92** which is force-fitted around the axle **90**. A first seal **93** and a second seal **94** are respectively engaged between the axle **90** and the tube **80** for protecting the first and the second bearings **90**, **903** from dust entering therein.

However, there are only the race **92**, the first and the second seals **93**, **94** disposed between the axle **90** and the tube **80** such that the axle **90** tends to be loosened when the bicycle ridden over a rugged road.

The present invention provides a bottom bracket which has a tube having a first end with a hole defined therein which has an inner tapered periphery for engagement with a tapered flange extending from the axle and a second end with a plurality of hook elements for engagement with a cap so as to mitigate and/or obviate the above-mentioned problem.

SUMMARY OF THE INVENTION

The present invention provides a bottom bracket for a bicycle, which includes an axle with first and second flanges extending therefrom and extending through a tube, a first cap and a second cap are respectively disposed to each of two ends of the axle, a housing is threadedly engaged to the first and the second caps, a bearing is disposed to the axle between each end of the tube and the first and the second caps respectively, one end of the tube has a plurality of hook elements for engagement with the second cap and the other end of the tube has a hole with an inner tapered periphery of engaging with an outer tapered periphery of the first flange of the axle.

It is an object of the present invention to provide a bottom bracket having a tube with a plurality hook elements and a second cap with an engaging shoulder for securely engaged thereby.

It is another object of the present invention to provide a bottom bracket with a tube having a first hole with an inner tapered periphery and an axle having a first flange with an outer tapered periphery for securely engaged therebetween.

Other objects, advantages, and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side elevational view, partly in section, of a conventional bottom bracket;

FIG. **2** is an exploded view of a bottom bracket in accordance with the present invention;

FIG. **3** is a side elevational view, partly in section, of the bottom bracket in accordance with the present invention, and

FIG. **4** is a side elevational view, partly in section, of the bottom bracket wherein a housing is threadedly engaged thereto.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. **2** through **4**, a bottom bracket in accordance with the present invention generally includes a housing **74**, a first cap **60**, a second cap **50**, a tube **20**, a first bearing **40**, a second bearing **30** and an axle **10**. The housing **74** has a first end and a second end, the first end thereof having a first hole defined therein and having a first inner threaded periphery **741** defined therein, the second end thereof having a second hole defined therein and having a second inner threaded periphery **742** defined therein. The tube **20** has a first end and a second end, the first end thereof having a first hole **23** centrally defined therein and having an inner tapered periphery **231** defining the first hole **23**, the second end thereof having a second hole **21** centrally defined therein and having a plurality of hook elements **221** extending longitudinally from the second end and each hook elements **221** having a hook portion **222**. The axle **10** for extending through the tube **20** has a first end and a second end, the first end thereof having a first flange **12** extending radially therefrom which has an outer tapered periphery **121**, the second end thereof having a second flange **11** extending radially therefrom, the outer tapered periphery **121** engaged to the inner tapered periphery **231** of the tube **20**.

The first cap **60** is a ring-shaped element having a first outer threaded periphery **61** defined therein, a first loop flange **63** extending radially and inwardly from an inner periphery of the first cap **60** and a ring element **700** having an inner threaded periphery **701** defined therein for threadedly engaged to said first outer threaded periphery **61** of the first cap **60**. The second cap **50** has a first end and a second end and has a second outer threaded periphery **51** defined in an outer periphery thereof, the second end thereof having a flange **52** extending outwardly and radially therefrom, a second loop flange **53** extending radially and inwardly from an inner periphery thereof and an engaging shoulder **541** defined in the inner periphery of the first end of the second cap **50** for engagement with the hook elements **221** of the tube **20**.

When assembling, the second cap **50** is threadedly engaged to the housing **74** by the second outer threaded

periphery **51** and the second inner threaded periphery **742**, a second loop seal **531** having a groove **532** defined in a periphery thereof is engaged to the second loop flange **53** by receiving the second loop flange **53** in the groove **532**, the second bearing **30** is disposed between the second loop flange **53** and the second end of the tube **20** through which the axle **10** extends, the axle **10** extends out from the second cap **50** and each hook portion **222** of the hook elements **221** is engaged to the engaging shoulder **541**. The first flange **12** of the axle **10** is engaged to the inner tapered periphery **231** of the first hole **23** of the tube **20** and the first bearing **40** is disposed between the first end of tube **20** and the first loop cap **63** of the first cap **60** which is threadedly engaged to the first end of the housing **74** wherein a first loop seal **631** having a groove **632** defined in a periphery thereof is engaged to the first loop flange **63** similar to the engagement of the second loop seal **531** and the second loop flange **53**. The ring element **700** then threadedly engaged to the first cap **60** such that the first and the second ends of the housing **74** abut against the ring element **700** and the flange **52** of the second cap **50**. Therefore, the axle **10** is securely positioned by the engagement of the hook elements **221** and the engaging shoulder **541** and the engagement of the first flange **12** and the first hole **23** of the tube **20**.

Although the invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the spirit and scope of the invention as hereinafter claimed.

I claim:

1. A bottom bracket for a bicycle, and comprising:

a housing having a first end and a second end, said first end thereof having a first hole defined therein and having a first inner threaded periphery defined therein, said second end thereof having a second hole defined therein and having a second inner threaded periphery defined therein;

a tube having a first end and a second end, said first end thereof having a first hole centrally defined therein and having an inner tapered periphery defining said first hole, said second end thereof having a second hole centrally defined therein and having a plurality of hook elements extending longitudinally from said second end;

an axle for extending through said tube and having a first end and a second end, said first end thereof having a first flange extending radially therefrom, said second end thereof having a second flange extending radially therefrom and said first flange having a outer tapered periphery formed therein for engagement with said inner tapered periphery of said tube;

a first cap being a ring-shaped element and having a first outer threaded periphery defined therein and having a first loop flange extending radially and inwardly from an inner periphery thereof, a ring element having an inner threaded periphery defined therein and threadedly engaged to said first outer threaded periphery of said first cap;

a second cap having a first end and a second end and having a second outer threaded periphery defined in an outer periphery thereof, said second end thereof having a flange extending outwardly and radially therefrom, a second loop flange extending radially and inwardly from an inner periphery thereof and an engaging shoulder defined in said inner periphery of said first end of said second cap for engagement with said hook elements of said tube, and

a first bearing disposed between said first loop flange and said first end of said tube, a second bearing disposed between said second loop flange and said second end of said tube and, said housing threadedly engaged to said first outer threaded periphery of said first cap and the second outer threaded periphery of said second cap.

2. The bottom bracket as claimed in claim **1** wherein said inner tapered periphery of said first hole of said tube has a increasing diameter from first end of said tube toward said second end of said tube.

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